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☐ 1. Document ID: US 6578615 B1

**Using default format because multiple data bases are involved.**

L3: Entry 1 of 23

File: USPT

Jun 17, 2003

US-PAT-NO: 6578615

DOCUMENT-IDENTIFIER: US 6578615 B1

TITLE: Magic slate capture and display device

DATE-ISSUED: June 17, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Bronson; Barry	Saratoga	CA		

US-CL-CURRENT: 156/386; 434/410

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWMC	Draw Desc	Ima
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☐ 2. Document ID: US 6468265 B1

L3: Entry 2 of 23

File: USPT

Oct 22, 2002

DOCUMENT-IDENTIFIER: US 6468265 B1

TITLE: Performing cardiac surgery without cardioplegia

Application Filing Date (1):  
19991109

Detailed Description Text (223):

The calibration target 2006 as indicated in FIG. 46 consists of a square array of circular spots 2008 of known size and spacing printed on a piece of paper by a laser or inkjet printer for example. This could be replaced by a more stable and rugged target, but a paper target can be satisfactory. The spot diameter is typically 1 mm, with a center-to-center spacing of 5 mm. A single spot at the center of the target as indicated by 2010 is offset by 2 mm so that the center and gross orientation of the target are identifiable in an image. Generally, the exact positioning and orientation of the target 2006 are found as part of the calibration process.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWMC	Draw Desc	Ima
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☐ 3. Document ID: US 6435654 B1

L3: Entry 3 of 23

File: USPT

Aug 20, 2002

h e b b g e e f e ef b e

DOCUMENT-IDENTIFIER: US 6435654 B1  
TITLE: Color calibration for digital halftoning

Application Filing Date (1):  
20000107

Detailed Description Text (5):

Since color calibration is generally required for each color printer and for each different printer medium, the present invention provides for a color printer calibration technique that employs a 2-by-2 centering technique and an optical scattering compensation technique. FIG. 1 is a schematic block diagram of a printing system 100 for calibrating a digital color printer according to the teachings of the present invention. The illustrated printing system 100 includes a calibrator 101 for generating elementary halftone color patches according to a 2-by-2 centering technique which provide a halftone-algorithm independent characterization of a printer 103. After the color patches are printed on a medium 105 with the printer 103, an optical characteristic of the elementary halftone color patches printed on the medium 105 are measured by a calorimeter 107 and transferred back to the calibrator 101. The calibrator 101 converts the measured optical characteristic of the elementary halftone color patches into color values while concomitantly considering the optical scattering caused by the medium. This is illustratively represented by the input compensation value .gamma., which can be varied or adjusted as a function of the printer medium and/or ink in order to more closely match the predicted optical characteristics of the color patches with the actually measured patches. The .gamma. values can be stored in any suitable storage element, such as a table. The calibrator 101 also stores the converted optical characteristic of the elementary halftone color patches in an appropriate storage device, such as a Random Access Memory (RAM), an Electrically Erasable Programmable Read Only Memory (ROM), a Flash Memory, or like storage devices.

Detailed Description Text (6):

The calibrator 101 generates arbitrary halftone color patches in accordance with the halftone algorithm of the printer 103. The calibrator 101 calculates the optical characteristics of a number of arbitrary halftone color patches by summing the optical characteristics of the elementary halftone color patches that are included in the arbitrary halftone color patch. The calibrator 101 generates image signals that are transferred to the printer 103, which in turn prints the arbitrary halftone color patches on the medium 105. The optical characteristics of the arbitrary halftone color patches printed on the medium 105 are measured by the colorimeter 107 in order to determine the difference between the calculated optical characteristic of an arbitrary halftone color patch and the measured optical characteristic of the arbitrary halftone color patch. While the calibrator 101 and the printer 103 are illustrated as being separate from each other in FIG. 1, those skilled in the art will appreciate that the calibrator 101 can be included in the printer 103. Furthermore, the ordinarily skilled artisan will appreciate that the colorimeter 107 can also be included in the printer 103, if desired, in order to automatically calibrate the color printer. Hence, the resulting printing system 100 can be an integrated printing system.

CLAIMS:

1. A method for calibrating a color printer, said method comprising the steps of (a) providing a set of elementary halftone color patches printed by the color printer on a medium, (b) measuring an optical characteristic of the elementary halftone color patches, (c) representing an arbitrary halftone color patch with a composite of the elementary halftone color patches, (d) selecting an optical characteristic adjustment parameter .gamma., by minimizing an overall error in an optical characteristic for at least one arbitrary halftone color patch, (e) calculating the overall error in an optical characteristic for at least one adjustment parameter .gamma., (f) selecting the adjustment parameter .gamma. that achieves the minimum overall error in the optical characteristic, and (g) adjusting the measured optical characteristic of the elementary halftone color patches with said adjustment parameter .gamma. to reflect an optical characteristic of the medium and to compensate for said optical characteristic of said

medium.

24. A printing system suitable for calibrating a digital color printer, said system comprising: a storage element for storing an optical characteristic of a plurality of elementary halftone color patches printed on a medium; a compensator for converting said optical characteristics of said elementary halftone color patches into a compensated optical characteristic value in response to a compensation value; a calculation stage for calculating an optical characteristic value of a plurality of arbitrary halftone color patches created according to a halftone algorithm in response to said compensated optical characteristic value of the elementary halftone color patches, a measuring element for measuring an optical color characteristic value of the arbitrary halftone color patches printed on a medium; and a comparator for comparing the calculated optical characteristic value of the arbitrary halftone color patches with the measured optical characteristic value of the arbitrary halftone color patches to characterize said compensation value.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Ima
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☒ 4. Document ID: US 6396595 B1

L3: Entry 4 of 23

File: USPT

May 28, 2002

DOCUMENT-IDENTIFIER: US 6396595 B1

TITLE: Method of and apparatus for color conversion data

Application Filing Date (1):  
19980715

Brief Summary Text (7):

Specifically, predicting the colors of final prints with a color printer needs various conversion tables, including a printing condition correcting conversion table for converting color image data in view of printing conditions (e.g., the type of the print paper used, and the type of inks used) of a color printing machine, a standard color conversion table for making standard color corrections depending on the output principles (e.g., halftone dot modulation or density modulation) of the color printer and the color printing machine, independently of the printing conditions, and a calibration conversion table for correcting individual characteristics of the color printer, the environment in which the color printer is used, and characteristic changes due to aging of the color printer. Using these conversion tables, it is possible to produce color images easily which are highly accurately predictive of the colors of final printed materials.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Ima
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☒ 5. Document ID: US 6191867 B1

L3: Entry 5 of 23

File: USPT

Feb 20, 2001

DOCUMENT-IDENTIFIER: US 6191867 B1

TITLE: Method and device for calibrating an imaging apparatus

Application Filing Date (1):  
19971117

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Brief Summary Text (12):

For the reasons stated above, and for other reasons stated below which will become apparent to those skilled in the art upon reading and understanding the present specification, there is a need in the art for a method and device for calibrating a halftone printing system without requiring operator intervention, thereby adapting to drifts in overall system performance including variations in media characteristics and media development parameters. Furthermore, there is a need in the art for a calibration device that minimizes imaging errors due to dot gain.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Ima
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☐ 6. Document ID: US 6035152 A

L3: Entry 6 of 23

File: USPT

Mar 7, 2000

DOCUMENT-IDENTIFIER: US 6035152 A

TITLE: Method for measurement of tone reproduction curve

Abstract Text (1):

A printing machine having a moving imaging surface, a projecting system for modulating a beam and projecting an image onto the imaging surface, a developer for application of toner to the image projected onto the imaging surface for transfer of the image to a medium, a method of development control including the steps of; generating a setup calibration tone curve base on a preset representative halftone patches; marking a test pattern in the interdocument zone of the imaging surface, the test pattern comprising a plurality of halftone patches; sensing the test pattern and measuring a relative reflection of each of said plurality of halftone patches in the interdocument zone of the imaging surface; entering said measured values into a matrix and correlating said matrix to a plurality of print quality actuators; generating a representative tone reproduction curve base on the matrix results; producing a feedback signal by comparing the representative tone reproduction curve to said setup calibration tone curve; and adjusting independently each of said print quality actuators to adjust printing machine operation for print quality correction

Application Filing Date (1):

19980409

Brief Summary Text (10):

A printing machine having a moving imaging surface, a projecting system for modulating a beam and projecting an image onto the imaging surface, a developer for application of toner to the image projected onto the imaging surface for transfer of the image to a medium, a method of development control including the steps of; generating a setup calibration tone curve base on a preset representative halftone patches; marking a test pattern in the interdocument zone of the imaging surface, the test pattern comprising a plurality of halftone patches; sensing the test pattern and measuring a relative reflection of each of said plurality of halftone patches in the interdocument zone of the imaging surface; entering said measured values into a matrix and correlating said matrix to a plurality of print quality actuators; generating a representative tone reproduction curve base on the matrix results; producing a feedback signal by comparing the representative tone reproduction curve to said setup calibration tone curve; and adjusting independently each of said print quality actuators to adjust printing machine operation for print quality correction.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Ima
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☐ 7. Document ID: US 6030066 A

L3: Entry 7 of 23

File: USPT

Feb 29, 2000

DOCUMENT-IDENTIFIER: US 6030066 A

TITLE: Method and apparatus for ink jet printer color balance calibration and correction

Application Filing Date (1):19971031

## CLAIMS:

11. An inkjet printer system having at least two multi-channel printheads for ejecting a plurality of different color ink droplets onto a print medium, comprising:

a calibration arrangement for causing the printheads to eject selectively a plurality of different color ink droplets in a matrix array configuration on a single page of print medium, said matrix array configuration including a plurality of substantially identical images, each image exhibiting a visually perceptible different contrast from the other images in said matrix array for facilitating the calibrating of drop volume variations between the at least two printheads; and

a correction arrangement responsive to a selection of an individual one of said plurality of substantially identical images for applying a corresponding hue shift correction factor for substantially balancing any drop volume variations between the at least two printheads relative to any subsequently printed image.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KWIC	Draw Desc	Ima
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☐ 8. Document ID: US 5953136 A

L3: Entry 8 of 23

File: USPT

Sep 14, 1999

DOCUMENT-IDENTIFIER: US 5953136 A

TITLE: Method for producing photographic copies from photographic originals

Application Filing Date (1):19970804Detailed Description Text (53):

First, the first printer is calibrated; that is, for this purpose the exposure matrix, which is an example for the paper-related film model, and the paper model or the model inverse to it (inverse paper model), is determined or optimized. During the calibration, the first copies (paper prints) produced from the production negatives are assessed by densitometry. This assessment can be made with a densitometer, which is located at the output of the paper processor downstream of the first printer and which assesses the developed paper prints "on-line". To do so, the developed paper prints are scanned regionally, such as pixel by pixel. The scanning light remitted from each scanning region of the respective paper print is delivered to a detector array, broken down spectrally, and converted into wavelength- and intensity-dependent electrical scanning signals. The electrical scanning signals are digitized and evaluated to ascertain copy-specific data, which can be the paper density vectors .DELTA.d.sub.n (the subscript "n" is intended to

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indicate that this involves the calibration operation).

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachment	Claims	KWIC	Draw Desc	Ima
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☐ 9. Document ID: US 5796414 A

L3: Entry 9 of 23

File: USPT

Aug 18, 1998

DOCUMENT-IDENTIFIER: US 5796414 A

TITLE: Systems and method for establishing positional accuracy in two dimensions based on a sensor scan in one dimension

Application Filing Date (1):  
19960325

Brief Summary Text (48):

The system includes a printing medium. The system also includes a positional-deviation calibration pattern. The calibration pattern comprises an array of substantially diagonal indicia, formed on the printing medium by the at least one automatic marking implement.

CLAIMS:

1. A system, for use with a plurality of automatic marking implements that scan transversely, and for determining positional deviations, as between the implements, from a nominal position; said system comprising:

a printing medium; and

a positional-deviation calibration pattern comprising an array of substantially diagonal indicia formed on the printing medium by the automatic marking implements;

said array comprising a plurality of subarrays each formed by one of such plurality of implements respectively, each subarray being an assemblage of substantially diagonal indicia; and

each subarray comprising a multiplicity of substantially parallel lines;

wherein the indicia are all formed in a single scan.

2. A system, for use with a plurality of automatic marking implements that scan transversely, and for determining positional deviations, as between the implements, from a nominal position; said system comprising:

a printing medium; and

a positional-deviation calibration pattern comprising an array of substantially diagonal indicia formed on the printing medium by the automatic marking implements;

said array comprising a plurality of subarrays each formed by one of such plurality of implements respectively, each subarray being an assemblage of substantially diagonal indicia; and

wherein the subarrays are disposed in series transversely across the printing medium.

3. A system for determining positional deviation of at least one automatic marking implement from a nominal position, and for use with such an automatic marking implement that scans transversely; said system comprising:

a printing medium; and

a positional-deviation calibration pattern comprising an array of substantially diagonal indicia formed on the printing medium by the at least one automatic marking implement;

said array comprising a multiplicity of substantially parallel lines; and

wherein the indicia are all formed in a single scan.

4. A system for determining positional deviation of at least one automatic marking implement from a nominal position; said system comprising:

a printing medium;

a positional-deviation calibration pattern comprising an array of substantially diagonal indicia formed on the printing medium by the at least one automatic marking implement; and

an array of substantially vertical indicia also formed by the at least one automatic marking implement.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Abstracts	Claims	KWMC	Draw. Desc	Ima
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# ☐ 10. Document ID: US 5754305 A

L3: Entry 10 of 23

File: USPT

May 19, 1998

DOCUMENT-IDENTIFIER: US 5754305 A

TITLE: Method and apparatus for correcting light non-uniformity in an LCD photographic printer

Application Filing Date (1):  
19961203

## CLAIMS:

11. A method of calibrating a printing apparatus which uses an active matrix liquid crystal to expose an image on photosensitive media by passing exposure light through said active matrix liquid crystal display and a corrective active matrix liquid crystal display for correcting the exposure light intensity, said method comprising the steps of:

a) placing said corrective active matrix liquid crystal display in the clear mode;

b) placing said imaging active matrix liquid crystal display at a first intensity setting;

c) measuring said intensity distribution of said exposure light so as to obtain a first pixel gain map of said exposure light for said first setting;

d) placing said imaging active matrix liquid crystal matrix display at a second intensity setting different from said first intensity setting;

e) measuring said intensity distribution of said exposure light so as to obtain a second pixel gain map of said exposure light for said second setting;

- f) using said first, and second pixel maps so as to obtain a system response;
- g) determining a corrective map for use in calculating corrective values for said corrective active matrix liquid crystal display; and
- h) applying said corrective values to said corrective active matrix liquid crystal display.

13. A method of calibrating a printing apparatus which uses an active matrix liquid crystal to expose an image on photosensitive media by passing exposure light through said active matrix liquid crystal display and a light exposure corrective device for correcting the exposure light intensity at discrete locations, said method comprising the steps of:

- a) placing said imaging active matrix liquid crystal display at a first intensity setting;
- b) measuring said intensity distribution of said exposure light so as to obtain a first pixel gain map of said exposure light for said first setting;
- c) placing said imaging active matrix liquid crystal matrix display at a second intensity setting different from said first intensity setting;
- d) measuring said intensity distribution of said exposure light so as to obtain a second pixel map of said exposure light for said second setting;
- e) using said first and second pixel maps so as to obtain a system response;
- f) determining a corrective gain map for use in calculating corrective values for said corrective active matrix liquid crystal display; and
- g) applying said corrective values to said light corrective device.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RWMC	Draw Desc	Ima
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☐ 11. Document ID: US 5649073 A

L3: Entry 11 of 23

File: USPT

Jul 15, 1997

DOCUMENT-IDENTIFIER: US 5649073 A

TITLE: Automatic calibration of halftones

Abstract Text (1):

A calibration system, for calibrating a printer response to halftone images directed thereto, includes a test pattern, stored in a memory, providing a plurality of samples of combinations of printed spots, printable on a media by the printer; a gray measuring device, to derive a gray measurement of the samples of printed spots; a calibration processor correlating gray measurements with a particular combination of spots, and deriving parameters describing the printer response to the particular combination; generating at least one gray image correction, including a set of correction values selected in accordance with said the described printer response, and a calibration memory, storing the generated halftone patterns.

Application Filing Date (1):

19951228

Brief Summary Text (11):

In accordance with one aspect of the invention, there is provided a calibration system,

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for calibrating a printer response to gray images directed thereto, including: a test pattern, stored in a memory, providing a plurality of samples of combinations of printed spots, printable on a media by said printer; a gray measuring device, to derive a gray measurement of said samples of printed spots; a calibration processor: correlating said gray measurement with a particular combination of spots, and deriving parameters describing said printer response to said particular combination; generating at least one gray image correction, from a gray reproduction scheme and said parameters said gray image correction including a set of correction values selected in accordance with said described printer response, and a calibration memory, storing said generated halftone patterns. In one embodiment, the gray measuring device can be either a scanner or a densitometer or a colorimeter.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachment	Claims	KWIC	Draw Desc	Ima
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☐ 12. Document ID: US 5416613 A

L3: Entry 12 of 23

File: USPT

May 16, 1995

DOCUMENT-IDENTIFIER: US 5416613 A

TITLE: Color printer calibration test pattern

Application Filing Date (1):

19931029

Detailed Description Text (7):

As noted, the colors are dispersed through color space, in an attempt to provide measurements through the entire printer gamut of colors. The calibration image 200 may be printed on one or more sheets of receiving material 204 (a substrate), which may be paper, transparencies or the like, with an understood optical response. An array of patches is printed, in an m.times.n array, with about a 1000 colors (although as few as 500 and as many as 4000 have been used), such a number being selected as providing a reasonable tradeoff of good interpolation results with a reasonable data set size for storage and handling. The limits of the printed array are spaced slightly inward from the edges 206 of the receiving material or substrate 204 to avoid edge effect non-uniformities common in printers. In one embodiment of the invention, the calibration image is printed on 8.5".times.11" paper and includes an array of 20.times.25 (500) patches in a field measuring about 7" by 9". The physical layout of the page is also suggested by a desire to have a user review the printed page to assure that it is a good print, and by the densitometer system, which may include an automatic indexing system for scanning through the document to measure each color. The target may therefore have registration marks to facilitate automatic scanning. It will of course be recognized that the receiving material or substrate used should represent one on which images will be made in the future, and the receiving material or substrate used should also be acceptable for use in the printer, so as not to cause printer non-linearity by its use.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachment	Claims	KWIC	Draw Desc	Ima
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☐ 13. Document ID: US 5109239 A

L3: Entry 13 of 23

File: USPT

Apr 28, 1992

DOCUMENT-IDENTIFIER: US 5109239 A

TITLE: Inter pen offset determination and compensation in multi-pen ink jet printing systems

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Application Filing Date (1):  
19900307

Brief Summary Text (2):

The present invention relates to ink jet printing apparatus employing a plurality of printing modules. More particularly, the invention relates to calibrating the distance between pens in the pen scan direction (Y), and calibrating the displacement of nozzle arrays relative to each other in the print media index axis (X).

Brief Summary Text (11):

In accordance with these and other features of the invention, there is provided a color alignment system for multiple pen ink jet printing systems having a capability to measure tolerance-related dot placement errors. This capability allows application of a correction algorithm to the drop fire timing and the image data such that the highest possible quality image is produced. As will be more fully understood hereinafter in conjunction with the detailed description and the accompanying drawings, the calibration system measures the distance between pens in the pen scan direction (Y), and measures the displacement of nozzle arrays in the print media index axis direction (X). The system is comprised of three elements: a drop detector, an aperture plate, and a high resolution carriage position sensor. In addition, and if desired, a wiper system may be employed to clean the aperture plate. The aperture plate is located between the pen orifice and the drop detector.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Ima
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☐ 14. Document ID: US 5036340 A

L3: Entry 14 of 23

File: USPT

Jul 30, 1991

DOCUMENT-IDENTIFIER: US 5036340 A

TITLE: Piezoelectric detector for drop position determination in multi-pen ink jet printing systems

Application Filing Date (1):  
19900307

Brief Summary Text (2):

The present invention relates to ink jet printing apparatus employing a plurality of printing modules. More particularly, the invention relates to calibrating the distance between pens in the pen scan direction (Y), and calibrating the displacement of nozzle arrays relative to each other in the print media index axis (X).

Brief Summary Text (6):

Commonly assigned U.S. Patent application Ser. No. 07/304,980, filed Jan. 31, 1989, now U.S. Pat. No. 4,922,270, issued May 1, 1990 entitled, "Inter Pen Offset Determination and Compensation in Multi-Pen Thermal Ink Jet Pen Printing Systems," by Cobbs et al., and a continuation-in-part thereof, U.S. patent application Ser. No. 07/490,022, filed Mar. 7, 1990, describe a highly useful invention for calibrating the distance between pens in the pen scan direction (Y), and calibrating the displacement of nozzle arrays relative to each other in the print media index axis (X).

Brief Summary Text (10):

The algorithm for the calibration of the distance between pens in the pen scan direction, and the calibration of the displacement of the nozzle arrays in the print media index direction is employed as a correction algorithm to electronically compensate the drop fire timing and the image data. This enables the multi-pen thermal ink jet printer of the

present invention to accurately overlay the primary color dots, thus resulting in a high quality image being produced.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KVMC	Draw Desc	Ima
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☐ 15. Document ID: US 4922270 A

L3: Entry 15 of 23

File: USPT

May 1, 1990

DOCUMENT-IDENTIFIER: US 4922270 A

TITLE: Inter pen offset determination and compensation in multi-pen thermal ink jet pen printing systems

Application Filing Date (1):  
19890131

Brief Summary Text (2):

The present invention relates to ink jet printing apparatus employing a plurality of printing modules. More particularly, the invention relates to calibrating the distance between pens in the pen scan direction (Y), and calibrating the displacement of nozzle arrays relative to each other in the print media index axis (X).

Brief Summary Text (11):

In accordance with these and other features of the invention, there is provided a color alignment system for multiple pen thermal ink jet printing systems having a capability to measure tolerance-related dot placement errors. This capability allows application of a correction algorithm to the drop fire timing and image data such that the highest possible quality image is produced. As will be more fully understood hereinafter in conjunction with the detailed description and the accompanying drawings, the calibration system measures the distance between pens in the pen scan direction (Y), and measures the displacement of nozzle arrays in the print media index axis direction (X). The system is comprised of three elements; a drop detector, an aperture plate, and a high resolution carriage position sensor. In addition, and if desired, a wiper system may be employed to clean the aperture plate. The aperture plate is located between the pen orifice and the drop detector.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KVMC	Draw Desc	Ima
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☐ 16. Document ID: US 4922268 A

L3: Entry 16 of 23

File: USPT

May 1, 1990

DOCUMENT-IDENTIFIER: US 4922268 A

TITLE: Piezoelectric detector for drop position determination in multi-pen thermal ink jet pen printing systems

Application Filing Date (1):  
19890131

Brief Summary Text (2):

The present invention relates to ink jet printing apparatus employing a plurality of printing modules. More particularly, the invention relates to calibrating the distance between pens in the pen scan direction (Y), and calibrating the displacement of nozzle

arrays relative to each other in the print media index axis (X).

Brief Summary Text (6):

Commonly assigned and concurrently filed U.S. patent application Ser. No. 07/304,980, entitled, "Inter Pen Offset Determination and Compensation in Multi-Pen Thermal Ink Jet Pen Printing Systems," by Cobbs et al., describes a highly useful invention for calibrating the distance between pens in the pen scan direction (Y), and calibrating the displacement of nozzle arrays relative to each other in the print media index axis (X).

Brief Summary Text (11):

The algorithm for the calibration of the distance between pens in the pen scan direction, and the calibration of the displacement of the nozzle arrays in the print media index direction is employed as a correction algorithm to electronically compensate the drop fire timing and image data. This enables the multi-pen thermal ink jet printer of the present invention to accurately overlay the primary color dots, thus resulting in a high quality image being produced.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequence	Attachments	Claims	KIMC	Draw Desc	Ima
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☐ 17. Document ID: US 4540990 A

L3: Entry 17 of 23

File: USPT

Sep 10, 1985

DOCUMENT-IDENTIFIER: US 4540990 A

TITLE: Ink jet printer with droplet throw distance correction

Application Filing Date (1):

19841022

CLAIMS:

1. An improved, continuous stream type ink jet printer of the type having a grounded, pressurized droplet generator with a plurality of nozzles in a linear array which emit streams of ink therefrom that are directed towards a moving recording medium, a charging electrode for each stream of ink located at the location where ink droplets are formed, whereat each droplet is encoded with a voltage representative of digitized information, a deflection electrode pair for each stream of droplets to direct the passing droplets to a specific location on the recording medium or to a gutter in accordance with the voltage the droplets received from the charging electrodes, a calibration sensor for calibrating the droplets so that they are properly stitched together at a predetermined printing plane, and a controller for operating the printer wherein the improvement comprises:

a linear array of distance sensing sensors mounted in a support member that is located below the droplet trajectories, the distance sensing sensors being parallel to the surface of the recording medium and perpendicular to direction of movement thereof, each distance sensor being adapted to produce a signal representative of the actual droplet throw distance from one or more nozzles to the surface of the recording medium at predetermined time periods;

means for comparing the signal representative of the actual droplet throw distance with a signal representative of a predetermined droplet throw distance;

means for generating a comparison signal in response to the comparison of the actual and predetermined throw distance signals, said comparison signal indicating any increase or decrease in the actual throw distance relative to the predetermined throw distance; and

means for adjusting the droplet trajectories in response to said comparison signals to correct the droplet trajectories for variations in the droplet throw distance relative to

the predetermined printing plane and maintain the droplet placement accuracies in spite of said throw distance variations.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw Desc	Ima
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☐ 18. Document ID: JP 2001189874 A

L3: Entry 18 of 23

File: JPAB

Jul 10, 2001

DOCUMENT-IDENTIFIER: JP 2001189874 A

TITLE: COLOR PRINTER CALIBRATION METHOD, CHARACTERIZING METHOD FOR OPTICAL CHARACTERISTIC ADJUSTMENT PARAMETER AND PRINTING SYSTEM SUITABLE FOR CALIBRATING DIGITAL COLOR PRINTER

Abstract Text (2):

SOLUTION: The method of this invention to calibrate a color printer includes a step where a set of element halftone color patches that is printed on a medium by the color printer is provided, a step where the optical characteristic of the element halftone color patches is measured by a colorimeter, a step where a calibrator selects an adjustment parameter gamma of the optical characteristic, and a step where the measured optical characteristic of the element halftone color patch is adjusted by a compensation device of the calibrator through the use of the adjustment parameter gamma by taking the optical characteristic of the medium into account.

Application Date (1):

20001122

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw Desc	Ima
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☐ 19. Document ID: JP 2001094803 A

L3: Entry 19 of 23

File: JPAB

Apr 6, 2001

DOCUMENT-IDENTIFIER: JP 2001094803 A

TITLE: INFORMATION PROCESSOR AND METHOD FOR PROCESSING IMAGE

Abstract Text (2):

SOLUTION: In the calibration for the printer having the possibility of generating the uneven density in a direction vertical to a paper feeding direction, the direction of the uneven density is set up vertically to the patch array direction of each color in the test pattern, so that the whole patch of a certain color can be prevented from being faintly printed out even when the patch is faintly printed out due to the influence of the uneven density. Consequently a situation that a state of the printer can't be faithfully reflected to read result of the color can be evaded.

Application Date (1):

19990917

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw Desc	Ima
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☐ 20. Document ID: WO 8903062 A1

L3: Entry 20 of 23

File: EPAB

Apr 6, 1989

DOCUMENT-IDENTIFIER: WO 8903062 A1

TITLE: SYSTEM FOR CALIBRATION AND CONTROL OF A PHOTOGRAPHIC COLOR PRINTER

Abstract Text (1):

CHG DATE=19990617 STATUS=O>A system for a photographic color printer which sets its exposure control device (lamphouse/shutter) to provide the illumination intensity of each color component (red, blue and green -- RGB) and the exposure time to produce test prints of the same print density from negatives having different exposures and therefore different densities. The printer is calibrated by means which calibrate a densitometer which can scan and read density over a matrix of pixels of the negative, and by means which calibrate the printing system including all components of the exposure control device; i.e. its lamps, filters, light leakage characteristics, printing medium (the photosensitive paper), and the parameters of the print developing process (the photochemistry which converts the exposed print into a print having a permanent image). The densitometer calibration and the photographic calibration is accomplished on a statistical basis by the use of a set of calibration film negative patches which are scanned during calibration of the printer by the densitometer and used to make a gamut of calibration prints on the printing medium after exposure by the exposure control device. The patches include sets of patches having different density (exposed at different f-stops) for each of several colors and neutral. Thus, the patches provide a plurality of density levels of a plurality of color and neutral variations. In the course of calibrating the photographic system of the printer a plurality of exposure variations (a set of deltas) is used so as to obtain the calibration prints, the number of which is equal to the number of calibration patches multiplied by the number of exposure variations in the set. A computer controlled system carries out a regression computation to derive models with matrices of coefficients and offsets, which when applied to density readings of production negatives, allows for complete compensation for the scanner, exposure device, photographic print media and processing system response characteristics and makes the control of the exposure device independent of such characteristics.

Application Date (1):19871001

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw Desc	Ima
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☐ 21. Document ID: US 6515770 B1

L3: Entry 21 of 23

File: DWPI

Feb 4, 2003

DERWENT-ACC-NO: 2003-401155

DERWENT-WEEK: 200338

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TITLE: Dither mask preparing method for picture printing on two-dimensional medium involves transforming dither matrix to calibrated dither mask satisfying predetermined mathematical expression

PF Application Date (1):19990316Standard Title Terms (1):

h e b b g e e e f e ef b e

DITHER MASK PREPARATION METHOD PICTURE PRINT TWO DIMENSION MEDIUM TRANSFORM DITHER MATRIX  
CALIBRATE DITHER MASK SATISFY PREDETERMINED MATHEMATICAL EXPRESS

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw Desc	Ima
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☐ 22. Document ID: HU 58609 T, HU 209582 B

L3: Entry 22 of 23

File: DWPI

Mar 30, 1992

DERWENT-ACC-NO: 1992-134580

DERWENT-WEEK: 199217

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TITLE: Level indicators - for calibration and size marking

Basic Abstract Text (1):

A 5-10x scaled-up drawing is the basis for prepn. of a screen-printed matrix, the matrix is then used to transfer to a paper card an original size calibration. The card is moistened and is baked onto the spirit level indicator at 400-600 deg.C.

PF Application Date (1):

19900104

PF Application Date (2):

19900104

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw Desc	Ima
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☐ 23. Document ID: US 4529301 A, DE 3480876 G, EP 138577 B

L3: Entry 23 of 23

File: DWPI

Jul 16, 1985

DERWENT-ACC-NO: 1985-189588

DERWENT-WEEK: 198531

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TITLE: Method of making colour prints - has paper exposed to varying amounts of primary colour light to develop colour matrix

PF Application Date (1):

19831017

PF Application Date (2):

19841011

Equivalent Abstract Text (1):

A process for making colour-balanced prints for a particular film material and a particular photography paper material, comprising the steps of: placing a grey film of the particular film material in a colour enlarger; exposing photography paper (60) of the particular material to light of a first colour; progressively and sequentially exposing first strips (40,41) of said paper (60) to decreasing amounts of light of a second colour; progressively and sequentially exposing second strips (50,51) of said paper (60) to decreasing amounts of light of a third colour, said second strips (50,51) being normal to said first strips (40,41); developing said paper (60) for obtaining therefrom a colour matrix (70) comprising a plurality of colour elements; and selecting a neutral grey element for colour calibration of the enlarger. (10pp)

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw. Desc	Ima
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Term	Documents
(2 AND 1).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	23
(L2 AND L1 ).PGPB,USPT,EPAB,JPAB,DWPI,TDBD.	23

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